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WE CLAIM:

A method for accelerating the rate of mucociliary clearance in a subject in need of such treatment comprising administering to the subject an effective mucociliary clearance stimulatory amount of a composition comprising a Kunitz-type serine protease inhibitor and a physiologically acceptable carrier.

- 2. The method according to claim 1, wherein the composition is administered to the lung airways.
- 3. The method according to claim 1, wherein said composition is administered directly by aerosolization.
 - 4. The method according to claim 1, wherein said composition is administered directly as an aerosol suspension into the mammal's respiratory tract.
 - 5. The method according to claim 4, wherein said aerosol suspension includes respirable particles ranging in size from about 1 to about 10 microns.
 - 6. The method according to claim 4 wherein said aerosol suspension includes respirable particles ranging in size from about 1 to about 5 microns.
 - 7. The method according to claim 4, wherein said aerosol suspension is delivered to said subject by a pressure driven nebulizer.
- 20 8. The method according to claim 4, wherein said aerosol suspension is delivered to said subject by an ultrasonic nebulizer.
 - 9. The method according to claim 4, wherein said aerosol suspension is delivered to said subject by a non-toxic propellant.
- 10. The method according to claim 1, wherein said carrier is a member selected from the group consisting of a physiologically buffered solution, an isotonic saline, normal saline, and combinations thereof.

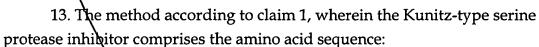
The method according to claim 1 wherein the Kunitz-type serine protease inhibitor is aprotinin.

The method according to claim 1, wherein the Kunitz-type serine protease inhibitor comprises the amino acid sequence:

MAQLCGL RRSRAFLALL GSLLLSGVLA -1

ADRERSIHDF CLVSKVVCRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50
YLTKEECLKK CATVTENATC DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF 100
NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 150
ACMLRCFRQQ ENPPLPLGSK VVVLAGLFVM VLILFLGASM VYLIRVARRN 200
QERALRTVWS SGDDKEQLVK NTYVL 225
(SEQ ID NO.: 49).

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	protease inhib	itor comprises	the amino acid	sequence:		
		\		AGSFLAWL (GSLLLSGVLA	-1
5	ADRERSIHDF	chvskvvgrc	RASMPRWWYN	VTDGSCQLFV	YGGCDGNSNN	50
	YLTKEECLKK	CATVTENATG	DLATSRNAAD	SSVPSAPRRQ	DSEDHSSDMF	100
	NYEEYCTANA	VTOPCRASFP	RWYFDVERNS	CNNFIYGGCR	GNKNSYRSEE	150
	ACMLRCFRQQ	ENPPLPLGSK	VVVLAGAVS			179
	(SEQ ID NO	.: 2),				
10		\				
		\	MLR A	AEADGVSRLL (GSLLLSGVLA	-1
	A DRERSIHDF	CLVSKVVERC	RASMPRWWYN	VTDGSCQLFV	YGGCDGNSNN	50
	YLTKEECLKK	CATVTENATG	DLATSRNAAD	SSVPSAPRRQ	DSEDHSSDMF	100
	NYEEYCTANA	VTGPCRASE	RWYFDVERNS	CNNFIYGGCR	GNKNSYRSEE	150
15	ACMLRCFRQQ	ENPPLPLGS	VVVLAGLFVM	VLILFLGASM	VYLIRVARRN	200
	QERALRTVWS	SGDDKEQLVK	NTYVL			225
	(SEQ ID NO	.: 45),	\			
			MAQLCGL 1	RRSRAFLALL (GSLLLSGVLA	-1
20	A DRERSIHDF	CLVSKVVGRC	RASMPRWWYN	VTDGSCQLFV	YGGCDGNSNN	50
	YLTKEECLKK	CATVTENATG	DLA TSRNAAD	SSVPSAPRRQ	DSEDHSSDMF	100
	NYEEYCTANA	VTGPCRASFP	RWYFDVERNS	CNNFIYGGCR	GNKNSYRSEE	150
	ACMLRCFRQQ	ENPPLPLGSK	VVVLAGLEVM	VLILFLGASM	VYLIRVARRN	200
	QERALRTVWS	FGD	\			213
25	(SEQ ID NO	.: 47),	\			
			\			
	A DRERSIHDF	CLVSKVVGRC	RASMPRWWYN	VTDGSCQLFV	YGGCDGNSNN	50
			\	_	DSEDHSSDMF	
				1	GNKNSYRSEE	
30	ACMLRCFRQQ	ENPPLPLGSK	VVVLAGLFVM	VLILFLGASM	VYLIRVARRN	200
		SGDDKEQLVK	NTYVL			225
	(SEQ ID NO	.: 70),		\		
				\		
0.5	and			\		
25				`		

ADRERSIHDF CLVSKVVGRC RASMPRWWYN VTDGS QLFV YGGCDGNSNN 50 YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF 100

NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 150 ACMLRCFRQ ENPPLPLGSK VVVLAGLFVM VLILFLGASM VYLIRVARRN 200 QERALRTVWS FGD 213 (SEQ ID NO.: 14. The method according to claim 1, wherein the Kunitz-type serine

5 protease inhibitor comprises the amino acid sequence: 10 IHDF CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50 YLTKEECLKK CATV 64 (SEQ ID NO.: 4), CLVSKVVGRC RASMPRWWYN\ VTDGSCQLFV YGGCDGNSNN 50 15 YLTKEECLKK C 61 (SEQ ID NO.: 5), YEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 150 ACMLRCFRQ 159 20 (SEQ ID NO.: 6), CTANAVTGPC RASFPRWYFD VERNSCNNFI YGGCRGNKNS YRSEE 150 ACMLRC 156 (SEQ ID NO.: 7), 25 IHDF CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50 YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 125 ACMLRCFRO 159 30 (SEQ ID NO.: 3),

CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN

50 YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRO DSEDHSSDMF 100 NYEEYCTANA VTGPCRASFP RWYFDVERNS\CNNFIYGGCR GNKNSYRSEE 150 ACMLRC 156 (SEQ ID NO.: 50),

ADRERSIHDF CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 25



YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF 75
NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 125
ACMLRCFRQQ ENPPLPLGSK VVVLAGAVS 179
(SEQ ID NO.: 1)

5

and

ADRERSIHDF CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50

10 YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF

NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE

ACMLRCFRQQ ENPPLPLGSK

170

(SEQ ID NO.: 52).

15. The method according to claim 1, wherein the Kunitz-type serine protease inhibitor comprises the amino acid sequence:

20 ADRERSIHDF CLVSKVVGRC RASMPRWYN VTDGSCQLFV YGGCDGNSNN 50 YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DS 92 (SEQ ID NO.: 8).

16. The method according to claims 12, 13, 14 or 15, wherein the Kunitz-type serine protease inhibitor is glycosylated.

17. The method according to claims 12, 13, 14 or 15, wherein the Kunitz-type serine protease inhibitor contains at least one intra-chain cysteine-cysteine disulfide bond.

18. The method according to claims 12, 13, 14, or 15, wherein the Kunitz-type serine protease inhibitor contains at least one intra-chain cysteine-cysteine disulfide bond selected from the cysteine-cysteine paired groups consisting of CYS11-CYS61, CYS20-CYS44, CYS36-CYS57, CYS106-CYS156, CYS115-CYS139, and CYS131-CYS152, wherein the cysteine residues are numbered according to the amino acid sequence of native human placental bikunin.

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- 19. Use of a Kunitz-type serine protease inhibitor in manufacturing a medicament for accelerating the rate of mucociliary clearance in a subject in need of such treatment.
- 20. Use according to claim 19, wherein the Kunitz-type serine protease inhibitor is in a form suitable for administration to lung airways.
- 21. Use according to claim 19, wherein the Kunitz-type serine protease inhibitor is in a form suitable for administration by aerosolization.
- 22. Use according to claim 19, wherein the Kunitz-type serine protease inhibitor is in a form suitable for administration as an aerosol suspension into the mammal's respiratory tract.
- 23. Use according to claim 22, wherein said aerosol suspension includes respirable particles ranging in size from about 1 to about 10 microns.
- 24. Use according to claim 22, wherein said aerosol suspension includes respirable particles ranging in size from about 1 to about 5 microns.
- 25. Use according to claim 22, wherein said aerosol suspension is generated by pressure driven nebulizer.
- 26. Use according to claim 22, wherein said aerosol suspension is generated by an ultrasonic nebulizer.
- 27. Use according to claim 22, wherein said aerosol suspension includes a non-toxic propellant.
- 28. Use according to claim 19, wherein medicament includes a carrier selected from the group consisting of a physiologically buffered solution, an isotonic saline, normal saline, and combinations thereof.
- 29. Use according to claim 19 wherein the Kunitz-type serine protease inhibitor is aprotinin.
- Use according to claim 19, wherein the Kunitz-type serine protease inhibitor comprises the amino acid sequence:

MAQLCGL RRSRAFIALL GSLLLSGVLA -1

ADRERSIHDF CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50
YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF 100
NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 150
ACMLRCFRQQ ENPPLPLGSK VVVLAGLFVM VLILFLGASM VYLIRVARRN 200
QERALRTVWS SGDDKEQLVK NTYVL 225
(SEQ ID NO.: 49).

22. Use according to claim 19, wherein the Kunitz-type serine protease inhibitor comprises the amino acid sequence:

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		1				
		1		AGSFLAWL (GSLLLSGVLA	-1
	ADRERSIHDF	drvskvvgrc	RASMPRWWYN	VTDGSCQLFV	YGGCDGNSNN	50
	YLTKEECLKK	CATVTENATG	DLATSRNAAD	SSVPSAPRRQ	DSEDHSSDMF	100
	NYEEYCTANA	VTGPCRASFP	RWYFDVERNS	CNNFIYGGCR	GNKNSYRSEE	150
5	ACMLRCFRQQ	ENPPLPLGSK	VVVLAGAVS			179
	(SEQ ID NO	.: 2),				
		\				
		\	MLR A	AEADGVSRLL (GSLLLSGVLA	-1
	A DRERSIHDF	CLVSKVVGRC	RASMPRWWYN	VTDGSCQLFV	YGGCDGNSNN	50
10	YLTKEECLKK	CATVTENATG	DLATSRNAAD	SSVPSAPRRQ	DSEDHSSDMF	100
	NYEEYCTANA	VTGPCRASFP	RWYFDVERNS	CNNFIYGGCR	GNKNSYRSEE	150
	ACMLRCFRQQ	ENPPLPLGSK	${\tt VVVLAGLFVM}$	VLILFLGASM	VYLIRVARRN	200
	QERALRTVWS	SGDDKEQIVK	NTYVL			225
	(SEQ ID NO	.: 45),				
15		\				
		/	MAQLCGL 1	RRSRAFLALL (GSLLLSGVLA	-1
	A DRERSIHDF	CLVSKVVGRC	RASMPRWWYN	VTDGSCQLFV	YGGCDGNSNN	50
	YLTKEECLKK	CATVTENATG	DLATSRNAAD	SSVPSAPRRQ	DSEDHSSDMF	100
	NYEEYCTANA	VTGPCRASFP	RWYFDVERNS	CNNFIYGGCR	GNKNSYRSEE	150
20	ACMLRCFRQQ	ENPPLPLGSK	VVLAGLFVM	VLILFLGASM	VYLIRVARRN	200
	QERALRTVWS	FGD				213
	(SEQ ID NO	.: 47),				
		/	1		YGGCDGNSNN	
25		1	1		DSEDHSSDMF	
		ı	/		GNKNSYRSEE	
		1	// / /	VLILFLGASM	VYLIRVARRN	
		SGDDKEQLVK	MTYVL\			225
	(SEQ ID NO	.: 70),				
30	_					
	and					
			1			
			1		YGGCDGNSNN	
. -			1		DSEDHSSDMF	
35		•	1		GNKNSYRSEE	
			VVVLAGLFVM	VLILFLGASM	VYLIRVARRN	
	QERALRTVWS	FGD	1			213



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(SEQ ID NO $_{\mathbf{k}}$: 71).

33. Use according to claim 19, wherein the Kunitz-type serine protease
inhibitor comprises the amino acid sequence:

IHDF CLVSKVVGRO RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50
YLTKEECLKK CATV
(SEQ ID NO.: 4),

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CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50
YLTKEECLKK C 61
(SEQ ID NO.: 5),

15 YEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 150
ACMLRCFRQ 159
(SEQ ID NO.: 6),

CTANAVTGPC RASFPRWYFD VERNSCNNFI YGGCRGNKNS YRSEE 150
ACMLRC 156

(SEQ ID NO.: 7),

IHDF CLVSKVVGRC RASMPRWYN VTDGSCQLFV YGGCDGNSNN 50
YLTKEECLKK CATVTENATC DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF 75
NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 125
ACMLRCFRQ 159

(SEQ ID NO.: 3),

CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50

30 YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF 100

NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 150

ACMLRC 156

(SEQ ID NO.: 50),

35 ADRERSIHDF CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 25
YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF 75
NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE 125
ACMLRCFRQQ ENPPLPLGSK VVVLAGAVS 179

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(SEQ ID NO $\ : 1)$,

and

5 ADRERSIHDF CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50

YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DSEDHSSDMF 100

NYEEYCTANA VTGPCRASFP RWYFDVERNS CNNFIYGGCR GNKNSYRSEE

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ACMLRCFRQQ ENPPLPIGSK

170

(SEQ ID NO.: 52).

33 34. Use according to claim 19, wherein the Kunitz-type serine protease inhibitor comprises the amino acid sequence:

ADRERSIHDF CLVSKVVGRC RASMPRWWYN VTDGSCQLFV YGGCDGNSNN 50 YLTKEECLKK CATVTENATG DLATSRNAAD SSVPSAPRRQ DS 92 (SEQ ID NO.: 8).

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34 35. Use according to claim 19, wherein the Kunitz-type serine protease inhibitor is glycosylated.

36. Use according to claim 19, wherein the Kunitz-type serine protease inhibitor contains at least one intra-chain cysteine-cysteine disulfide bond.

36. 37. Use according to claim 19, wherein the Kunitz-type serine protease inhibitor contains at least one intra-chain cysteine-cysteine disulfide bond selected from the cysteine-cysteine paired groups consisting of CYS11-CYS61, CYS20-CYS44, CYS36-CYS57, CYS106-CYS156, CYS115-CYS139, and CYS131-CYS152, wherein the cysteine residues are numbered according to the amino acid sequence of native human placental bikunin.